

S E M I N A R



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**Date:**

Tuesday, 12 March 2024

**Time:**

13h15-14h15 SAST

**Venue:**

- P213, Physics Building, East Campus, WITS
- Online

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# Quantum Gravity from the Lattice

**ABSTRACT**

Certain classes of quantum field theories at strong interaction strengths and finite temperatures are equivalent to quantum black hole geometries in dual weakly coupled gravitational theories. Such theories of quantum gravity and black holes arise in particular limits of parameters of certain classes of string theories. This equivalence between string and gauge theories is known as the holographic principle. To describe the features of quantum black holes and gravity, we need to study the dual field theories at finite temperatures. Such thermal theories are strongly coupled in practice and thus analytically intractable. We need a first-principles definition based on regularizing the field theory path integral on a spacetime lattice to study them reliably. In this talk, I will show some results from numerical computations based on path integral Monte Carlo that validate the holographic principle in several interesting cases.

**WHO SHOULD ATTEND?**

This talk is intended to be accessible to honors and postgraduate students, however, all are welcome. Familiarity with quantum field theory, string theory, quantum gravity, or Monte Carlo methods is NOT assumed.

**REGISTER:** <https://bit.ly/4bYAbcZ>

